

depositing a first material on a surface of said first gallium nitride based semiconductor layer to prevent a second gallium nitride based semiconductor layer from nucleating on said surface of said first gallium nitride based semiconductor layer; and

growing said second gallium nitride based semiconductor layer, of a material different from said first gallium nitride based semiconductor layer, extending from at least one of said side walls, a bottom surface of said trench being of a material such that said second gallium nitride based semiconductor layer will not nucleate thereon, said second gallium nitride based semiconductor layer having fewer defects than said first gallium nitride based semiconductor layer.

94 14. (New) The method of claim 13 wherein at least one additional layer is formed between said first gallium nitride based semiconductor layer and said substrate.

15. (New) The method of claim 13 further comprising depositing a second material to prevent said second gallium nitride based semiconductor layer from growing on said bottom surface of said trench.

16. (New) The method of claim 15 wherein said second material is an electrical conductor.

17. (New) The method of claim 16 wherein said second material is titanium nitride.

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18. (New) The method of claim 13 further comprising depositing material to prevent gallium nitride from growing on one of said side walls of said trench.

19. (New) The method of claim 13 wherein said forming a trench is conducted before said depositing.

20. (New) The method of claim 13 wherein said trench extends all the way through said first gallium nitride based semiconductor layer.

21. (New) The method of claim 13 wherein said first gallium nitride based semiconductor layer is aluminum gallium nitride and said second gallium nitride based semiconductor layer is gallium nitride.

22. (New) The method of claim 13 wherein said first material is silicon dioxide.

23. (New) The method of claim 13 wherein said first material is deposited on a top surface of said first gallium nitride based semiconductor layer.

24. (New) The method of claim 13 further comprising depositing additional layers overlying said second gallium nitride based semiconductor material, wherein at least one of said additional layers is a first cladding layer.

25. (New) The method of claim 24 wherein at least one of said additional layers is an active layer overlying said cladding layer.

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26. (New) The method of claim 25 wherein at least one of said additional layers is a second cladding layer overlying said active layer.

27. (New) The method of claim 13 further comprising depositing additional layers overlying said second gallium nitride based semiconductor material, wherein at least one of said additional layers is an active layer for emitting light.

28. (New) The method of claim 13 wherein said first material overlaps at least a portion of at least one of said side walls.

29. (New) A gallium nitride based semiconductor material overlying a substrate of a dissimilar material grown by a method comprising:

forming a first gallium nitride based semiconductor layer overlying said substrate, said first gallium nitride based semiconductor layer having defects due to a lattice mis-match between said substrate and said first gallium nitride based semiconductor layer;

forming a trench in said first gallium nitride based semiconductor layer, said trench having a bottom surface and side walls;

depositing a first material on a surface of said first gallium nitride based semiconductor layer to prevent a second gallium nitride based semiconductor layer from nucleating on said surface of said first gallium nitride based semiconductor layer; and

growing said second gallium nitride based semiconductor layer, of a material different from said first gallium nitride based semiconductor layer, extending from at least one of said side walls, a bottom surface of said trench being of a material such

that said second gallium nitride based semiconductor layer will not nucleate thereon, said second gallium nitride based semiconductor layer having fewer defects than said first gallium nitride based semiconductor layer.

30. (New) The gallium nitride based semiconductor material of claim 29 wherein said method of growing further comprises forming at least one additional layer between said first gallium nitride based semiconductor layer and said substrate.

31. (New) The gallium nitride based semiconductor material of claim 29 wherein said forming a trench is conducted before said depositing.

32. (New) The gallium nitride based semiconductor material of claim 29 wherein said trench extends all the way through said first gallium nitride based semiconductor layer.

33. (New) The gallium nitride based semiconductor material of claim 29 wherein said first material is deposited on a top surface of said first gallium nitride based semiconductor layer.

ABSTRACT

Please amend the abstract to read as follows:

A low defect gallium nitride based semiconductor, and method for its production, is disclosed. A first gallium nitride based semiconductor layer overlying a substrate of a dissimilar material is grown. A trench is formed in the first gallium nitride based semiconductor layer. A material is deposited on a surface of the first gallium nitride based

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